CLAIMS

What is claimed is:

1. An agent for receiving signals from at least one other locally spaced agent, the agent

5   comprising:

>   a. at least one signal receiver for receiving a strength signal having a signal

>   strength from at least one other locally spaced agent;

>   b. at least one data receiver for receiving a data signal including data from at

>   least one other locally spaced agent;

10   c. means for associating each data signal with a strength signal, where the data

>   signal and the strength signal associated are from the same other locally

>   spaced agent; and

>   d. means for selecting a data signal based on its associated strength signal.

15 2. An agent as set forth in claim 1, wherein the signal receiver and the data receiver are

>   each directional receivers and wherein the means for selecting selects a data signal

>   based on its associated strength and an associated signal direction.

3. An agent as set forth in claim 2, wherein the directional receivers determine direction

20   by receiving digital signals in angular regions.

4. An agent as set forth in claim 3, wherein the angular regions may be selectively combined to allow for different angular accuracy in the determination of the direction from which a digital signal was received.

5   5. An agent as set forth in claim 1, wherein the agent further comprises a means for approximating a distance from which the strength signal has traveled based on the signal strength of the strength signal.

6. An agent as set forth in claim 1, wherein the signal receiver and the data receiver are

10   incorporated as a single receiver.

7. An agent as set forth in claim 6, wherein the strength signal and the data signal are combined into a message signal including a signal strength and data.

15   8. An agent as set forth in claim 7, wherein the agent is configured for receiving the message signal in the form of a digital data packet having a data portion with at least one element.

9. An agent as set forth in claim 8, further comprising:

20   a.   a digital processor connected with the receiver for receiving the digital data packet;

b. an analog to digital converter connected with the receiver and with the digital

    processor for digitizing the signal strength and for providing the digitized

    signal strength to the digital processor; and

c. a memory connected with the processor for storing digital data packets.

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10. An agent as set forth in claim 9, wherein the agent further comprises a means for

    time stamping received digital data packets and for storing the time stamped received

    digital data packets in memory along with the digital data packets.

10   11. An agent as set forth in claim 10, wherein the means for selecting the data signal

    selects a message based on at least one element selected from the group consisting of

    the digital data packet, the signal strength, and the time stamp.

12. An agent as set forth in claim 9, wherein the means for selecting the data signal

15   selects a message signal based on its digital data packet and signal strength.

13. An agent as set forth in claim 10, further comprising a means for checking the

    validity of received digital data packets, and wherein digital data packets found

    invalid are removed from the memory.

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14. An agent as set forth in claim 13, wherein the signal receiver and the data receiver are

    each directional receivers and wherein the means for selecting selects a data signal

    based on its associated signal strength and an associated signal direction.

15. An agent as set forth in claim 14, wherein the directional receivers determine direction by receiving digital signals in angular regions.

5   16. An agent as set forth in claim 15, wherein the angular regions are represented as bins in the memory, wherein the bins may be selectively combined to allow for different angular accuracy in the determination of the direction from which a digital signal was received.

10   17. An agent as set forth in claim 13, wherein the agent is configured for receiving the message signals of different types, and wherein the means for selecting is operated independently for signals of each type.

18. An agent as set forth in claim 13, wherein the agent is configured to receive message
15   signal including digital data packets each including at least one cumulative data portion, and wherein the agent further comprises a means for modifying the cumulative data portion.

19. An agent as set forth in claim 18, wherein the agent further comprises a means for
20   generating local data, and wherein the means for modifying the cumulative data portion of the digital data packets uses the local data for modifying the cumulative data portion.

20. An agent as set forth in claim 18, wherein the means for selecting the data signal selects a message based on at least one element selected from the group consisting of the digital data packet, the signal strength, the time stamp, and the cumulative data portion of the digital packets.

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21. An agent as set forth in claim 20, wherein the agent is configured for receiving the message signals of different types, and wherein the means for selecting is operated independently for signals of each type.

10   22. An agent as set forth in claim 20, wherein the cumulative data portion includes a cumulative strength measure, and wherein means for modifying the cumulative data portion of the digital packets uses the signal strength from the strength signal to modify the cumulative strength measure.

15   23. An agent as set forth in claim 22, wherein the signal receiver and the data receiver are each directional receivers and wherein the means for selecting selects a data signal based on its associated strength and an associated signal direction.

24. An agent as set forth in claim 23, wherein the directional receivers determine

20   direction by receiving digital signals in angular regions.

25. An agent as set forth in claim 24, wherein the angular regions are represented as bins in the memory, wherein the bins may be selectively combined to allow for different

angular accuracy in the determination of the direction from which a digital signal was received.

26. An agent as set forth in claim 25, further comprising a transmitter connected with the

5   processor for transmitting a digital signal including a digital packet to at least one other locally spaced agent.

27. An agent as set forth in claim 26, further comprising a means for detecting when the same signal just transmitted by the transmitter is received back in the receiver in order

10   to detect reflection from objects near the agent and a means for determining the signal strength of the signal and for using the signal strength to approximate the distance of an object from the agent.

28. An agent as set forth in claim 26, wherein the receivers are selected from the group

15   consisting of optical receivers, acoustic receivers, and radio frequency receivers.

29. An agent as set forth in claim 29, wherein the receivers are infrared receivers.

30. An agent as set forth in claim 26, wherein the transmitters are directional transmitters.

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31. An agent as set forth in claim 30, wherein the directional transmitters transmit by sending signals in angular regions.

32. An agent as set forth in claim 31, wherein the angular regions into which the transmitters transmit are represented as bins in the memory, wherein the bins may be selectively combined to allow for different angular breadth for the signal transmission.

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33. An agent as set forth in claim 26, wherein the transmitters are selected from the group consisting of optical receivers, acoustic receivers, and radio frequency receivers.

34. An agent as set forth in claim 34, wherein the transmitters are infrared transmitters.

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35. An agent as set forth in claim 26, wherein the transmitter is configured to transmit a signal including a data packet including the modified cumulative data portion of the selected signal.

15 36. An agent as set forth in claim 26, wherein the transmitted signals have transmission strengths, and wherein the transmitter may be configured to vary the transmission strength.

37. An agent as set forth in claim 36, wherein the data packet transmitted further includes

20 a data packet including information regarding the transmission strength of the transmitted signals whereby the means for selecting an agent receiving the signal can account for the altered signal strength of the signal when selecting among signals.

38. A method for communicating among a plurality of agents, the method comprising:

    a.   receiving, at an agent from another locally spaced agent, at least one strength signal having a signal strength;

    b.   receiving, at an agent from another locally spaced agent, at least one data signal including data;

    c.   associating each data signal with a strength signal, where the data signal and the strength signal associated are from the same other locally spaced agent; and

    d.   selecting a data signal based on its associated strength signal.

39. A method for communicating among a plurality of agents as set forth in claim 38, wherein in the receiving steps, strength signals and the data signals are each received from a direction, and wherein in the selecting step, the data signal is selected based on its associated strength signal and the direction from which it was received.

40. A method for communicating among a plurality of agents as set forth in claim 39, wherein in the receiving steps, the directions from which the strength signals and the data signals are received are angular regions.

41. A method for communicating among a plurality of agents as set forth in claim 40, wherein the receiving steps further comprise a step of selectively combining angular regions from which signals may be received to allow for different angular accuracy in the determination of the direction from which a digital signal is received.

42. A method for communicating among a plurality of agents as set forth in claim 38, further comprising a step of approximating a distance from which a strength signal has traveled based on the signal strength of the strength signal.

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43. A method for communicating among a plurality of agents as set forth in claim 38, wherein the strength signal and the data signal are received in the same receiving step.

10   44. A method for communicating among a plurality of agents as set forth in claim 43, wherein in the receiving step, the strength signal and the data signal are received as a single message signal.

45. A method for communicating among a plurality of agents as set forth in claim 44, 15   wherein in the receiving step, the message signal is received in the form of a digital packet having a data portion with at least one element.

46. A method for communicating among a plurality of agents as set forth in claim 45, further comprising the steps of digitizing the signal strength of the message signal for 20   receipt by a digital processor and storing the digital data packets in a memory.

47. A method for communicating among a plurality of agents as set forth in claim 46, the method further comprising the step of time stamping the received digital data packets,

and wherein in the step of storing the digital packets in a memory, the time stamps of the received digital data packets are stored in memory along with the digital data packets.

5   48. A method for communicating among a plurality of agents as set forth in claim 47, wherein in the selection step, the selection of a message is based on at least one element selected from a group consisting of the digital data packet, the signal strength, and the time stamp.

10   49. A method for communicating among a plurality of agents as set forth in claim 46, wherein in the selection step, the selection of a message is based on the digital data packet and the signal strength.

50. A method for communicating among a plurality of agents as set forth in claim 49,

15   further comprising the steps of checking the validity of received digital packets and removing digital packets found invalid from memory.

51. A method for communicating among a plurality of agents as set forth in claim 50, wherein in the receiving step, the signals are each received from a direction, and

20   wherein in the selecting step, the data signal is selected based on its associated strength signal and the direction from which it was received.

52. A method for communicating among a plurality of agents as set forth in claim 51, wherein in the receiving steps, the directions from which the strength signals and the data signals are received are angular regions.

5   53. A method for communicating among a plurality of agents as set forth in claim 52, wherein the receiving steps further comprise a step of selectively combining angular regions from which signals may be received to allow for different angular accuracy in the determination of the direction from which a digital signal is received.

10   54. A method for communicating among a plurality of agents as set forth in claim 50, wherein in the receiving step, message signals of different types are received, and wherein the step of selecting is operated independently for signals of each type.

55. A method for communicating among a plurality of agents as set forth in claim 50, 15   wherein in the receiving step, messages are received including digital packets, each including at least one cumulative data portion, and the method further comprising a step of modifying at least one cumulative data portion of the digital packets.

56. A method for communicating among a plurality of agents as set forth in claim 55, 20   further comprising a step of generating local data, and the modifying step uses the local data for modifying the cumulative data portion.

57. A method for communicating among a plurality of agents as set forth in claim 55, wherein in the selecting step, a message is selected based on at least one element selected from a group consisting of the digital data packet, the signal strength, the time stamp, and the cumulative data portion of the digital packets.

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58. A method for communicating among a plurality of agents as set forth in claim 57, wherein in the receiving step, message signals of different types are received, and wherein the step of selecting is operated independently for signals of each type.

10   59. A method for communicating among a plurality of agents as set forth in claim 57, wherein in the receiving step, the cumulative data portion of the signal received includes a cumulative strength measure, and wherein in the modifying step, signal strength of the received signal is used to modify the cumulative strength measure of the cumulative data portion.

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60. A method for communicating among a plurality of agents as set forth in claim 59, wherein in the receiving step, the signal is received from a direction and wherein in the selecting step, the signal is selected based on the direction from which it was received.

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61. A method for communicating among a plurality of agents as set forth in claim 60, wherein in the receiving step, the directions from which signals are received are angular regions.

62. A method for communicating among a plurality of agents as set forth in claim 61, wherein the receiving step further comprises a step of selectively combining angular regions from which signals may be received to allow for different angular accuracy in

5   the determination of the direction from which a digital signal is received.

63. A method for communicating among a plurality of agents as set forth in claim 62, further comprising the step of transmitting a digital signal, including a digital packet, from the agent to at least one other locally spaced agent.

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64. A method for communicating among a plurality of agents as set forth in claim 63, further comprising a step of detecting when the same signal just transmitted by the transmitter is received back in the receiver in order to detect reflection from objects near the agent, and a step of determining the approximate distance from an object

15   based on the strength of the signal received.

65. A method for communicating among a plurality of agents as set forth in claim 64, wherein in the receiving step, the signals received are from the group consisting of optical signals, acoustic signals, and radio frequency signals.

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66. A method for communicating among a plurality of agents as set forth in claim 64, wherein in the receiving step, the signals received are infrared signals.

67. A method for communicating among a plurality of agents as set forth in claim 63, wherein in the transmitting step, the digital signal is transmitted in a direction.

68. A method for communicating among a plurality of agents as set forth in claim 67,

5   wherein in the transmitting step, the digital signal is transmitted in an angular region.

69. A method for communicating among a plurality of agents as set forth in claim 68, wherein in the transmitting step further comprises a step of selectively combining angular regions to which signals are transmitted to allow for different angular

10   accuracy in the determination of the direction to which a digital signal is transmitted.

70. A method for communicating among a plurality of agents as set forth in claim 63, wherein in the transmitting step, the signals transmitted are from the group consisting of optical signals, acoustic signals, and radio frequency signals.

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71. A method for communicating among a plurality of agents as set forth in claim 70, wherein in the transmitting step, the signals transmitted are infrared signals.

72. A method for communicating among a plurality of agents as set forth in claim 63,

20   wherein in the transmitting step, the signal transmitted includes a data packet including the modified cumulative data portion of the selected signal.

73. A method for communicating among a plurality of agents as set forth in claim 63, wherein the transmission step further comprises a step of optionally varying the transmission strength.

5   74. A method for communicating among a plurality of agents as set forth in claim 63, wherein in the transmission step, that data packet transmitted includes information regarding the transmission strength of the transmitted signals, and wherein the selecting step further comprises a sub-step of using received information regarding the transmission strength to account for the altered strength of a signal when selecting

10   from among signals.

75. A computer program product for use in facilitating communication among a plurality of agents, the computer program product comprising:

   a. means for receiving, at an agent from another locally spaced agent, at least

15   one strength signal having a signal strength;

   b. means for receiving, at an agent from another locally spaced agent, at least one data signal including data;

   c. means for associating each data signal with a strength signal, where the data signal and the strength signal associated are from the same other locally

20   spaced agent; and

   d. means for selecting a data signal based on its associated strength signal.

76. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 75, wherein the means for selecting enables the data signal to be selected based on its associated strength signal and a direction from which it was received.

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77. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 76, wherein the computer program product provides a means for selectively combining angular regions from which signals may be received to allow for different angular accuracy in the determination of the direction from

10   which a digital signal is received.

78. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 75, further comprising a means for approximating a distance from which a strength signal has traveled based on the signal strength of the

15   strength signal.

79. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 75, further comprising a means for time stamping received digital data packets and for storing the digital packets in a memory along

20   with associated time stamps.

80. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 79, further comprising a means for selecting a message is based on at least one element selected from a group consisting of a digital data packet, a signal strength, and a time stamp.

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81. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 75, further comprising a means for selecting a message based on the digital data packet and the signal strength.

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82. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 81, further comprising a means for checking the validity of received digital packets and removing digital packets found invalid from memory.

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83. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 82, wherein the means for selecting enables the data signal to be selected based on its associated strength signal and a direction from which it was received.

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84. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 83, wherein the computer program product provides a means for selectively combining angular regions from which signals may be received

to allow for different angular accuracy in the determination of the direction from which a digital signal is received.

85. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 82, configured for use with signals received of different types, whereby the means for selecting is operated independently for signals of each type.

86. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 82, further comprising a means for modifying at least one cumulative data portion of a digital packet.

87. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 86, further comprising means for receiving local data and wherein the means for modifying the cumulative data portion uses the local data for modifying the cumulative data portion.

88. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 86, wherein the means for selecting a message selects a message based on at least one element selected from a group consisting of a digital data packet, a signal strength, a time stamp, and a cumulative data portion of the digital packets.

89. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 88, configured for use with signals received of different types, whereby the means for selecting is operated independently for signals of each type..

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90. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 90, wherein the means for receiving is configured to receive a cumulative strength measure in the cumulative data portion of a signal received, and wherein the means for modifying modifies the cumulative strength with

10   a strength from the received signal.

91. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 90, wherein the means for selecting enables the data signal to be selected based on its associated strength signal and a direction from

15   which it was received.

92. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 91, wherein the computer program product provides a means for selectively combining angular regions from which signals may be received

20   to allow for different angular accuracy in the determination of the direction from which a digital signal is received.

93. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 92, further comprising means for generating a digital signal for transmission to at least one other locally spaced agent, the digital signal including a digital packet.

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94. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 93, a means for detecting when the same signal just transmitted by the transmitter is received back in the receiver in order to detect reflection from objects near the agent, and a means for determining the approximate

10 distance from an object based on the strength of the signal received.

95. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 93, further comprising means for determining a direction in which to transmit a signal and for controlling a transmitter to transmit a

15 signal in the determined direction.

96. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 95, wherein the computer program product provides a means for selectively combining angular regions from which signals may be received

20 to allow for different angular accuracy in the determination of the direction from which a digital signal is received.

97. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 93, wherein the means for generating a digital signal for transmission generates a data packet including the modified cumulative data portion of a signal selected by the means for selecting.

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98. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 93, further comprising a means for controlling the transmitter to optionally vary the transmission strength.

10   99. A computer program product for use in facilitating communication among a plurality of agents as set forth in claim 98, wherein in the means for generating a digital signal for transmission generates a data packet including information regarding the transmission strength of the transmitted signals, and wherein the means for selecting step further includes the ability to use received information regarding the

15   transmission strength to account for the altered strength of a signal when selecting from among signals.